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US6024053 or 6024053

### US Design Patent

D0318249

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RE35312

### US SIR

H1523

### US Patent Applications

20020012233

### World Patents

WO04001234 or WO2004012345

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## Patent Abstract

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EPA 2003-02-05 1281571/EP-A2 **Vehicle visibility assist device and method**

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KAISHA 1, Toyota-cho, Toyota-shi Aichi-ken 471-8571 JP **DESIGNATED COUNTRIES-** AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LI, LU, MC, NL, PT, SE, SK, TR

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A vehicle visibility assist device is started up when a switching operation of a switch for an external vehicle light is detected and when it is determined by a brightness sensor that it is darker outside of the vehicle than a predetermined threshold. The visibility assist device projects infrared light to a region outside the vehicle, captures a reflection of the light, processes an image of the region outside the vehicle, and projects the image onto a surface visible to the vehicle operator.

**EXEMPLARY CLAIMS-** An apparatus comprising:; a visibility assist device for providing an image outside a vehicle captured by irradiation of an infrared light;; a brightness sensor (510) for detecting brightness outside the vehicle; and; a controller for detecting a position of a switch of an illumination device that illuminates a region outside the vehicle; and for controlling startup of the visibility assist device such that the visibility assist device is started when the detected brightness is lower than a predetermined level and the detected position of the switch of the illumination device of the vehicle indicates the illumination device is on.; The apparatus according to claim 1, further comprising a main switch (170) configured to be placed in a selected one of at least two states, including a first state in which startup of the visibility assist device is permitted, and a second state in which startup of the visibility assist device is prohibited, wherein the controller performs the startup of the visibility assist device when the main switch is switched to the first state.; The apparatus according to claim 1, further comprising an illumination control device that automatically and alternatively turns on and off the illumination device in accordance with the detected brightness outside the vehicle.; The apparatus according to claim 1, wherein the illumination device comprises a headlight, and the controller detects a switching operation for alternately turning the headlight on and off.; An apparatus comprising:; a visibility assist device that provides an image outside a vehicle captured by irradiation of an infrared light;; an infrared light projecting unit that projects an infrared light to a predetermined region outside the vehicle so as to capture a reflected image of the predetermined region outside the vehicle; and

NO-DESCRIPTORS

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